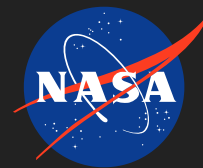


Sample Preparation and Processing for Nanopore Life Detection Instruments

Completed Technology Project (2017 - 2018)



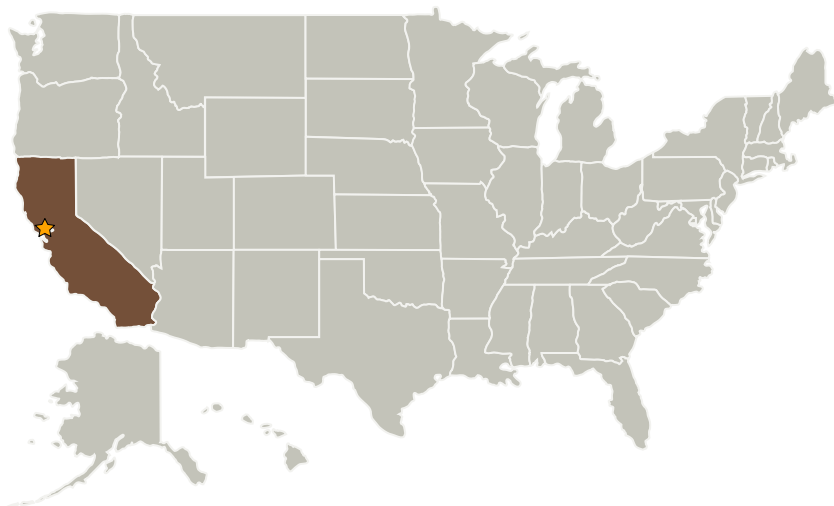
Project Introduction

The technical approach includes physically disrupting samples as a first step in sample preparation. Sample will then delivered for separation based on molecular charge via ion-exchange chromatography. Polyanionic and polycationic polymers, along with other charged molecules, will be eluted off the ion-exchange column for continued downstream processing. The charged particles will then be sorted according to their size via gel-filtration chromatography and delivered to solid-state nanopore device.

Anticipated Benefits

There is a need for a microfluidic front-end, sample-processing device to enable autonomous solid-state nanopore life detection instruments because current flight instruments can not appropriately preprocess samples prior to analysis. We will incorporate into one single automated microfluidic system: cell lysis, extraction of charged particles and sorting based on size distribution.

Primary U.S. Work Locations and Key Partners



Sample Preparation and
Processing for Nanopore Life
Detection Instruments

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Sample Preparation and Processing for Nanopore Life Detection Instruments

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
SETI Institute(SETI)	Supporting Organization	Academia	Moffett Field, California
University of California-Santa Cruz	Supporting Organization	Academia Hispanic Serving Institutions (HSI)	Santa Cruz, California

Primary U.S. Work Locations

California

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Center Innovation Fund: ARC CIF

Project Management

Program Director:

Michael R Lapointe

Program Manager:

Harry Partridge

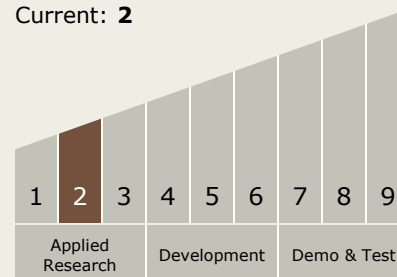
Principal Investigator:

Antonio J Ricco

Technology Maturity (TRL)

Start: 2

Current: 2



Sample Preparation and Processing for Nanopore Life Detection Instruments

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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.3 In-Situ Instruments and Sensors
 - └ TX08.3.3 Sample Handling

Target Destinations

Mars, Others Inside the Solar System